

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A method of operating a paging system, the paging system including a central control station and a paging unit, the method comprising:

transmitting, on a first frequency, a clock-aligning

5 signal from the central control station to the paging unit;

transmitting, on a second frequency, a pager command numeric data from the central control station to the pager.

transmitting, on a third frequency, and in response to the pager command, pager status data and alphanumeric data from the paging unit to the central control station;

transmitting, on a fourth frequency, a pager transmission request signal from the paging unit to the central control station, the pager transmission request signal being transmitted in a predetermined time slot assigned to the paging unit, the predetermined time slot being related to the clock-aligning signal and assigned whereby the fourth frequency is utilizable by a plurality of other paging units;

wherein the first frequency, second frequency, third frequency, and fourth frequency differ from one another.

2 A method of operating a paging system wherein a paging unit acquires radio communication with a control station, the method comprising:

5 transmitting a clock-aligning signal from the control station;

10 using the clock-aligning signal to align therewith a clock of the paging unit;

15 transmitting from the control station a station identification message which includes station identifying information;

20 determining if the station identifying information received at the paging unit has changed and, upon determination of such change executing the following steps:

25 generating, at the paging unit, a station switch request signal, the step of generating the station switch request signal including generating a frame of information including a plurality of time divided slots in accordance with the clock-aligning signal, and selecting one of the plurality of time slots as a time slot to be at least temporarily associated with the paging unit;

30 receiving the station switch request signal at the control station and responsively transmitting from the control station an authorization message, which authorization message authorizes the paging unit to engage in further communications;

25 transmitting, in response to reception of the  
authorization message, a paging unit identification message which  
includes pager identification information of the paging unit;  
downloading, to the paging unit from the control  
station, a set of local frequencies for further communication  
30 between the paging unit and the control station.

3. The method of claim 2, wherein the control station transmits and/or receives messages on a first common frequency, a second common frequency, a third common frequency, and a fourth common frequency, and wherein the clock-aligning signal from the second control station is transmitted on the first common frequency, wherein the station identification message is transmitted on the second common frequency; wherein the station switch request signal is transmitted on the fourth common frequency; and wherein the authorization message is transmitted on the third common frequency,

4. The method of claim 2, wherein the transmission authorization message includes a frame of information including a same plurality of time divided slots in accordance with the clock-aligning signal as in the station switch request signal, and wherein information is stored in a same time slot as in the station switch request signal.

5. The method of claim 2, wherein, in response to reception of the paging unit identification message, the control station determines whether the pager identification information included in the paging unit identification message is valid.
6. The method of claim 2, wherein a first local frequency is used to transmit a local clock-aligning signal from the central control station to the paging unit; wherein a second local frequency is used to transmit a pager command and alphanumeric data from the central control station to the paging unit; wherein a third local frequency is used to transmit alphanumeric data from the paging unit to the central control station; and wherein a fourth local frequency is used to transmit a transmission request signal from the paging unit to the central control station.
7. The method of claim 6, wherein the transmission request signal is transmitted in a predetermined time slot assigned to the paging unit, the predetermined time slot being related to the local clock-aligning signal and assigned whereby the fourth local frequency is utilizable by a plurality of other paging units.
8. The method of claim 2, wherein the first local frequency, second local frequency, third local frequency, and fourth local frequency differ from one another.

9. A two-way paging unit capable acquiring radio communication with a control station, the paging unit comprising:

a first receiver for receiving a clock-modulated first frequency transmitted by the control station;

5 a clocking unit and a clock alignment circuit which aligns the clocking unit with the clock-modulated first frequency;  
a second receiver which receives a second frequency, the second frequency being at least intermittently modulated to include station identifying information which identifies the control

10 station;

a processor which determines if station identifying information received by the processor has changed and which, upon determination of such change, generates a station switch request signal, the station switch request signal including a frame of information comprising a plurality of time divided slots related to the clock-modulated first frequency, and wherein one of the plurality of time slots is selected by the processor as a time slot to be at least temporarily associated with the paging unit;

20 a transmitter for transmitting the station switch request signal to the central station.

10. The apparatus of claim 9, wherein the processor further detects receipt of a transmission authorization message and in response thereto causes a transmission of a paging unit identification message.

11. The apparatus of claim 10, wherein the transmission authorization message is detected as having a frame of information including a same plurality of time divided slots as in the station switch request signal, and wherein information is stored in a same time slot as in the station switch request signal.

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12. The apparatus of claim 10, further comprising a transmitter for transmitting the paging unit identification message.

13. The apparatus of claim 9, wherein the paging unit receives from the control station a downloaded set of local frequencies for use in further communication between the paging unit and the control station.

14. A control station which communicates with a two-way paging unit, the control station comprising:  
a clock unit which generates at least a first clocking signal;  
a first receiver which receives a station switch request signal from the paging unit, the station switch request signal including a frame of information comprising a plurality of time divided slots related to the first clocking signal, one of the plurality of time slots as selected by the paging unit bearing information serving to at least temporarily associate with the paging unit with the selected time slot;

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a processor which prepares a paging unit transmit authorization signal, the paging unit transmit authorization signal including a frame of information comprising a same plurality of time divided slots as the station switch request signal and information in a same selected one of the time slots as in the station switch request signal;

a transmitter for transmitting the paging unit transmit authorization signal.

15. The apparatus of claim 14, wherein the processor of the control station generates a local frequency download message for downloading a set of local frequencies for use in further communication between the paging unit and the control station, and wherein the transmitter transmits the local frequency download message.

16. The apparatus of claim 15, wherein the clock unit generates a second clocking signal for use as a local clocking signal, and wherein the local clocking signal is transmitted on a first of the local frequencies.

17. The apparatus of claim 14, wherein a first local frequency is used to transmit a local clock-aligning signal from the central control station to the paging unit; wherein a second local frequency is used to transmit a pager command and alphanumeric data from the central control station to the paging

unit; wherein a third local frequency is used to transmit alphanumeric data from the paging unit to the central control station; and wherein a fourth local frequency is used to transmit a transmission request signal from the paging unit to the central control station; wherein the transmission request signal is transmitted in a predetermined time slot assigned to the paging unit, the predetermined time slot being related to the local clock-aligning signal and assigned whereby the fourth local frequency is utilizable by a plurality of other paging units.

18. The apparatus of claim 17, wherein the processor of the control station generates a slot assignment message for downloading a set of local frequencies for use in further communication between the paging unit and the control station, and wherein the transmitter transmits the local frequency download message.

5 19. The apparatus of claim 14, wherein in response to the paging unit transmit authorization signal the control station receives a

paging unit identification message which includes paging unit identification information, and wherein the processor determines whether the paging unit identification information is valid.

20. A control station which communicates with a paging unit, the control station comprising:

a first transmitter for transmitting a set of local frequencies to a cell region associated with the control station;

5 a second transmitter for transmitting a set of switching signal frequencies to a switching region associated with the control station;

a clock unit for generating a local clock signal and a switching clock signal;

10 a processor for generating message information and switching information; and

wherein a first of the local frequencies is modulated to carry the local clock signal, a second of the local frequencies is modulated to carry the message information; a first of the switching signal frequencies is modulated to carry the switching clock signal; and a second of the switching signal frequencies is modulated to carry the switching information.

15 21. The apparatus of claim 20, wherein the first transmitter is operated at a greater power than the second transmitter.

22. The apparatus of claim 20, wherein the cell region has a greater geographical extent than the switching region.

23. The apparatus of claim 20, further comprising:

5 a first receiver which receives a station switch request signal from the paging unit, the station switch request signal including a frame of information comprising a plurality of time divided slots related to switching clock signal, one of the plurality of time slots as selected by the paging unit bearing information serving to at least temporarily associate with the paging unit with the selected time slot;

10 wherein the processor prepares a paging unit transmit authorization signal, the paging unit transmit authorization signal including a frame of information comprising a same plurality of time divided slots as the station switch request signal and information in a same selected one of the time slots as in the station switch request signal; and

15 wherein the first transmitter transmits the paging unit transmit authorization signal.

24. The apparatus of claim 23, wherein the processor of the control station generates a local frequency download message for downloading the set of local frequencies for use in further communication between the paging unit and the control station, and wherein the first transmitter transmits the local frequency download message.

25. The apparatus of claim 23, wherein the second of the local frequencies is used to transmit a pager command and alphanumeric data from the central control station to the paging unit; wherein a third of the local frequencies is used to transmit alphanumeric data from the paging unit to the central control station; and wherein a fourth of the local frequencies is used to transmit a transmission request signal from the paging unit to the central control station; wherein the transmission request signal is transmitted in a predetermined time slot assigned to the paging unit, the predetermined time slot being related to the local clock signal and assigned whereby the fourth of the local frequencies is utilizable by a plurality of other paging units.

26. The apparatus of claim 25, wherein in response to the paging unit transmit authorization signal the controls station receives a paging unit identification message which includes paging unit identification information, and wherein the processor determines whether the paging unit identification information is valid.

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